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09/813,988	03/22/2001	Noriko Suehiro	205040US0	2664

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EXAMINER

RUDE, TIMOTHY L

ART UNIT PAPER NUMBER

2871

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/813,988

Applicant(s)

SUEHIRO ET AL.

OK

Examiner

Timothy L Rude

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 4, 7, 9 and 11-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6, 8, 10, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims

1. Claims 1 and 2 are amended, however the limitations of claims 1 and 2 remain unchanged. Claims 22 and 23 are added. Declaration received 23 January 2004.

Claim Objections

2. Claim 2 remains objected to because of the following informalities: The equation for the value a , has incorrect units. Value a , is a distance measurement that cannot be expressed in terms of volts. For examination purposes, the denominator in said equation shall be interpreted as 10 volts. Appropriate correction is required, e.g., $V_{\max}/10$ volts.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

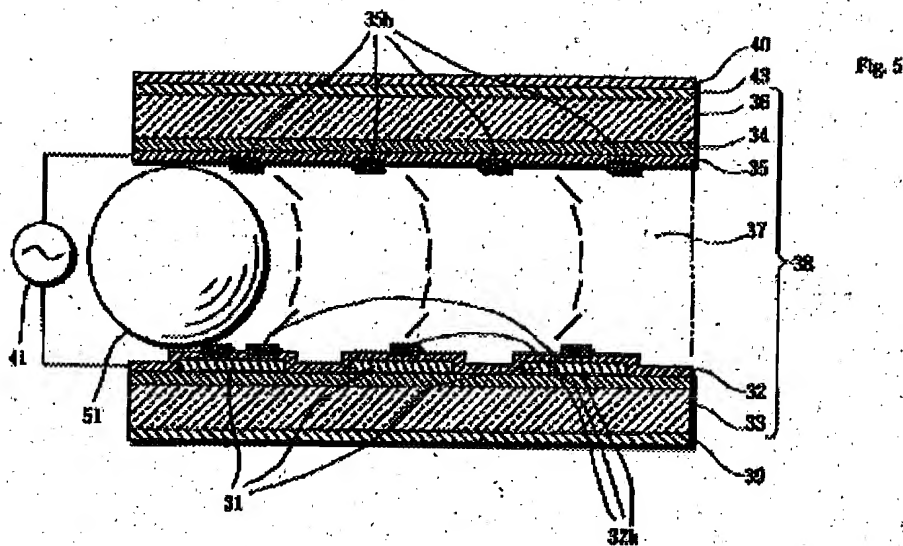
3. Claims 1-3, 5, 6, 8, 10, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori et al (Hattori) USPAT 2002/0067451 A1 in view of Morokawa

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et al (Morokawa) USPAT 5,654,782 and further in view of West et al (West) USPAT 5,453,863.

As to claims 1 and 2, Hattori discloses in Figure 5, embodiment one (embodiment one is at para [0081] through [0084]), a liquid crystal display (LCD) element comprising a front side substrate, 33, having a front side electrode, 31, a rear side substrate, 36, having a rear side electrode, 34, and a liquid crystal layer, 37, interposed therebetween wherein the liquid crystal layer exhibits a plurality of display states; a display state is changed by a voltage applied across the electrodes, with the electrically off state being maintained stably, the liquid crystal display element being characterized in that at least a part of the front side electrode and the front side substrate is transparent [0081]; the front side electrode is divided into a plurality of electrode regions (per Figure 5) on its substrate surface, and the thickness d (μm) of the liquid crystal layer is $6 \mu\text{m}$ [0081].

Hattori teaches the use of a chiral nematic additive to the liquid crystal to facilitate quick and reliable transition from a splay alignment to a bend alignment state (Abstract, first para). Hattori also teaches in embodiment five (para [0095] through [0105]) the use of a liquid crystal material with a chiral additive [0095] (Applicant's chiral nematic liquid crystal layer) in an LCD similar to embodiment one [0096].



Hattori does not explicitly disclose an element wherein the maximum space a (μm) between adjacent electrode regions and the thickness d (μm) of the liquid crystal layer satisfy a relational formula of $1.0 \cdot d \leq a \leq 4.0 \cdot d$.

Morokawa teaches the use of a pixel size of 100 to 200 μm to make the pixels non-distinct (better picture resolution, applicable and combinable with any type of liquid crystal matrix display, regardless of mode and liquid crystal material type) (col. 2, lines 24-28). Morokawa also teaches the use of gaps between adjacent pixels that are about 10% of the pixel dimension in order to obtain an aperture ratio of at least 80%. Those conditions result in $10 \mu\text{m} \leq a \leq 20 \mu\text{m}$.

Morokawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to combine use a pixel size of 100 to 200 μm to make the pixels non-distinct with the LCD of embodiment 5 of Hattori. This would result in $10 \mu\text{m} \leq a \leq 20 \mu\text{m}$ thereby satisfying $1.0 \cdot d \leq a \leq 4.0 \cdot d$, where $d = 6 \mu\text{m}$, specifically $6 \mu\text{m} \leq a \leq 24 \mu\text{m}$.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Hattori with the small electrode size and spacing of Morokawa to produce a high-resolution display with non-distinct pixels.

Hattori does not explicitly disclose in embodiment one a chiral nematic liquid crystal used for the liquid crystal layer; the maximum space a (μm) between adjacent electrode regions, the thickness d (μm) of the liquid crystal layer, and the maximum effective voltage V_{max} (V) of a voltage applied to the front side electrode and the rear side electrode satisfy a relational formula of $1.0 \cdot d \leq a \leq d \cdot V_{\text{max}}/10$.

Hattori teaches the use of a chiral nematic additive to the liquid crystal to facilitate quick and reliable transition from a splay alignment to a bend alignment state (Abstract, first para). Hattori also teaches in embodiment five (para [0095] through [0105]) the use of a liquid crystal material with a chiral additive [0095] in an LCD similar to embodiment one [0096].

Hattori also teaches the use of 8 volts applied [0084].

Morokawa teaches the use of a pixel size of 100 to 200 μm to make the pixels non-distinct (better picture resolution) (col. 2, lines 24-28). Morokawa also teaches the use of gaps between adjacent pixels that are about 10% of the pixel dimension in order to obtain an aperture ratio of at least 80%. Those conditions result in $10 \mu\text{m} \leq a \leq 20 \mu\text{m}$.

Morokawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to combine use a pixel size of 100 to 200 μm to

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make the pixels non-distinct with the LCD of Hattori. This would result in $10 \mu\text{m} \leq a \leq 20 \mu\text{m}$ thereby substantially satisfying $1.0 \cdot d \leq a \leq d \cdot V_{\text{max}}/10$, where $d = 6 \mu\text{m}$, specifically $6 \mu\text{m} \leq a \leq 19.2 \mu\text{m}$.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Hattori with the electrode size and spacing and chiral additive of Morokawa to produce a high-resolution display with non-distinct pixels and to facilitate quick and reliable transition (faster switching).

Hattori does not explicitly disclose a display comprising an amount of chiral dopant sufficient to provide reflection of visible light, and Hattori does not explicitly disclose that the liquid crystal layer in the interline portions remains in a focalconic state.

West teaches the use of a chiral dopant sufficient to provide reflection of visible light to achieve stable grey scale (col. 2, lines 10-23).

Applicants enabling disclosure (Specification, page 15, line 18, through page 18, line 8) provides the structural requirements to achieve a liquid crystal layer in the interline portions that remains in a focalconic state. Those structural requirements and driving voltages are met by the display of Hattori in view of Morokawa and further in view of West, above.

West is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a chiral dopant sufficient to provide reflection of visible light to achieve stable grey scale performance.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Hattori with the chiral dopant sufficient to provide reflection of visible light of West to achieve stable grey scale performance.

As to claim 3, Hattori discloses application of 8 V (Applicant's 48 V or less) [0084] and $d = 6 \mu\text{m}$ (Applicant's $2.5 \mu\text{m} \leq d \leq 6.0 \mu\text{m}$) [0081]. Also, the trend in the LCD industry is to move towards smaller dimensions of d .

As to claim 5, Hattori in view of Morokawa and further in view of West discloses a LCD display as described above.

Hattori does not explicitly disclose in embodiment one, a display wherein at least a part of the front side electrode is stripe-like electrodes and at least a part of the rear electrode is stripe-like electrodes, said stripe-like electrodes of the front side electrode and the rear side electrode being arranged so as to be crossed in the substrate plane.

However, conventional passive matrix LCDs commonly have at least a part of the front side electrode is stripe-like electrodes and at least a part of the rear electrode is stripe-like electrodes, said stripe-like electrodes of the front side electrode and the rear side electrode being arranged so as to be crossed in the substrate plane.

Hattori teaches that all embodiments can be made as passive matrix LCDs [0230].

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Also, Morokawa discloses a passive matrix LCD wherein at least a part of the rear electrode is stripe-like electrodes, said stripe-like electrodes of the front side electrode and the rear side electrode being arranged so as to be crossed in the substrate plane in Figure 1(B).

Morokawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to combine a rear electrode wherein at least a part of the rear electrode is stripe-like electrodes, said stripe-like electrodes of the front side electrode and the rear side electrode being arranged so as to be crossed in the substrate plane to the passive LCD of Hattori to form a passive matrix display.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Hattori with the crossed stripe-like electrodes of Morokawa to form a passive matrix display.

As to claim 6, Hattori in view of Morokawa and further in view of West discloses a LCD display as described above.

Hattori does not explicitly disclose the claimed electrode line density.

Morokawa teaches the use of a pixel size if between 100 and 200 μm to achieve a high-resolution display with non-distinct pixels, as described in the rejection of claim 2, above. This results in a disposition density L_d (number/mm) of the stripe-like electrodes that is substantially $5 \leq L_d \leq 10$ (well within Applicant's $2 \leq L_d \leq 15$).

As to claim 8, Hattori teaches the use of a rear side electrode covered with a reflective metal film to form a reflective electrode for a reflective display [0229].

As to claim 10, Hattori teaches that all of his embodiments may be applied to passive matrix devices [0230]. This would result in a dot matrix display wherein figures and characters may be displayed.

Also, Morokawa teaches the use of a passive matrix device as described in the rejection of claim 5, above.

Response to Arguments

4. Applicant's arguments filed on 23 January 2004 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) None of the applied references, alone or in combination, teach LC in interline portions in a focal conic state or is restored from planar state to a focal conic state.

(2) Applicant argues attributes of the invention.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that the limitations of "LC in interline portions in a focal conic state or is restored from planar state to a focal conic state" are performance limitations considered met by the structure as combined in the rejections above per Applicant's own enabling disclosure. Please note that claim language, though read in

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light of the specification, must stand on its own. Performance limitations must be met by the claimed structure and they must be interpreted in their most broad meaning as opposed to jargon in the art. For example, it is respectfully suggested that the limitation of "an amount of chiral dopant sufficient to provide reflection of visible light" does almost nothing to limit the claim because any amount of added chiral dopant [≥ 0] results in a visible mixture that obviously (therefore) reflects visible light. Furthermore West teaches the use of sufficient chiral dopant to provide reflection of visible light per rejections above. Examiner has rejected the claims as broadly written. Applicant is encouraged to claim structure that will result in the desired focal conic state, e.g., percentage of chiral dopant by weight along with alignment layer material type and surface conditions and any other relevant structural specifics, and to claim the mode of operation of the LC cell. However, enablement might be an issue. Please also note that examiner has no reason to reject that which is not claimed, and examiner has no need to show in prior art a functional mode of operation that is not explicitly claimed and fully enabled. The prior art provides ample motivation to result in the claimed structure, and based upon Applicant's enabling disclosure the focal conic performance must result.

(2) It is respectfully pointed out that examiner does not yet have an opinion as to whether there is novel subject matter in the specification. Examiner has searched and rejected the broadly written claims. The specification may provide explicit definitions for terms used in the claims, but general discussion and explanation in the specification may not be read into the claims. The device claims must claim structure that constitutes

the invention. If the structure that is claimed can be met by a combination of prior art that would not result in Applicant's invention, the invention is claimed too broadly to be allowable. Examiner simply may not allow the claims as presently written because in general performance recitations are not strong enough to limit device claims.

Applicant's burden is to disclose how to make and use the device. Applicant must disclose the structure of the device that results in the claimed performance. The claims as presently broadly written do not even claim a focal conic mode liquid crystal display. Examiner considers there to be no structural claim limitations that are not met by the rejections above that would account for focal conic performance in the interline portions or anywhere else.

Please also note: Applicant has not argued examiner's rationale for rejection of the dependent claims and has thereby acquiesced.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

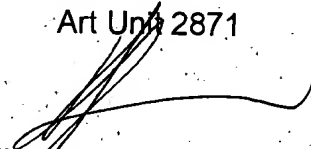
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude
Examiner
Art Unit 2871



KENNETH PARKER
PRIMARY EXAMINER